Rejections under 35 USC §103

Claims 1 and 6-9 have been rejected under 35 USC §103(a) as being unpatentable over Tachikawa '255 (US Patent No. 4,356,255) combined with Aoai '686 (US Patent No. 5,252,686).

The Examiner asserts that Aoai '686 discloses an orthoquinondiazide compound (column 193, line 17), a novolak resin (column 215, line 33), thioxanthone, and 2-chlorothioxanthone (column 233, lines 44-45), and silicon wafers (column 241, lines 6-7). This rejection is traversed for the following reasons.

Present Invention

The present invention discloses a positive resist composition, which comprises a novalec resin, a radiation-sensitive quinonediazide compound and a thioxanthone compound.

Disclosure of Tachikawa '255

Tachikawa '255 discloses a photosensitive member comprising a photosensitive layer containing an o-quinonediazide compound as a photosensitive agent and an additive, characterized in that the additive is selected from a group consisting of quinone compounds and aromatic ketone compounds, and a method for forming an image using the same. Tachikawa '255 further discloses both positive working and negative working processes

using the same. Tachikawa '255 discloses a photosensitive composition comprising a quinonediazide compound and a sensitizer (column 3, lines 3-15). Tachikawa '255 discloses thioxanthone on line 12 of column 3. However, thioxanthone is one of 21 mentioned compounds. Novolac is not explicitly mentioned (although a phenol resin is mentioned (see line 53, column 4). Finally, Tachikawa '255 does not disclose a silicon wafer.

Disclosure of Aoai '686

Aoai '686 discloses a novel siloxane polymer having at least 1 mol % of a structural unit derived from a cyclic heat addition product between a diene compound of formula (I) or (II) and an olefin or acetylene compound and a positive working light-sensitive composition comprising the siloxane polymer. Aoki '686 further discloses a positive working light-sensitive composition which makes it possible to form a presensitized plate for use in making a lithographic printing plate, proof sheets for process printing, figures for overhead projectors or fine resist patterns required for making integrated circuits of semiconductor elements; components or intermediates useful for the preparation of the positive-working light-sensitive composition; and a process for the preparation of the components or intermediates. Aoai '686 discloses thioxanthone, and 2-

chlorothioxanthone as two of 31 compounds. Further, Aoai '686 does not mention silicon wafers with the elements of the instant invention.

Removal of Tachikawa '255 and Aoai '686

Tachikawa '255 does not disclose the use of a silicone wafer as a substrate (as acknowledged by the Examiner). Aoai '686 does disclose the use of a silicone wafer as a substrate (e.g. Examples 19-24, Examples 25-26. Examples 33-38, Examples 39-40. etc.), however the photo resists (light sensitive compositions) coated on the silicone wafer in Aoai '686 are totally different from those of the present invention.

When a silicone wafer is used as a substrate for producing a semiconductor, high resolution of sub-micron order is required. (see the examples in Aoai '686.) In the examples in Aoai '686 where a silicone wafer is used (e.g. Examples 19-24, Examples 25-26, Examples 33-38, Examples 39-40, etc.), the sizes of line and space were measured (See, for example, column 241, line 52). However, in the other examples in Aoai '686, these sizes were not measured. This is because the performance, when a silicone wafer is used, is totally different from the case where a silicone wafer is not used. Accordingly, an artisan of ordinary skill would not be motivated to use, in the case where a silicone wafer is used, a photo resist, which is useful in the

case where a different substrate other than a silicone wafer is used. Thus, even if use of a thioxanthone compound in a photo resist is suggested in these documents, because the photo resist was never disclosed in combination with a silicon wafer, the artisan of ordinary skill would not be motivated to use the same resist in the case where a silicone wafer was used.

The Examiner mentions that the "motivation (to combine references) is based on a desire to expand the spectral sensitivity of the composition as well as activate the acid generators" (see page 4, lines 5-6 in the office action). However, in Table 1 in page 15 of the present specification Example 1, where a thioxanthone compound was used, should be compared to Comparative Example 1, where a thioxanthone compound was not used. (All other conditions were the same.) Example 1 did not exhibit higher sensitivity than Comparative Example 1. Applicants have thus shown that the artisan of ordinary skill would not be motivated to combine the references in an attempt to expand spectral sensitivity because the combination does not increase spectral sensitivity.

Applicants, however, have shown that when a thioxanthone compound was used, higher resolution results (relative to the situation where a thioxanthone compound is not used). This higher resolution is one of the aims of the present invention (See page 2, lines 13-16). Because there is neither description

nor suggestion in either of the documents cited by the examiner that the addition of a thioxanthone compound would improve resolution, the person of ordinary skill in the art would not be motivated to add a thioxanthone compound in a photo resist coated on a silicone wafer. Accordingly, motivation to combine the references is lacking. With motivation lacking to combine the references, a *prima facie* case of obviousness does not exist. Accordingly, the present invention is not obvious over the documents cited by the examiner, and the rejection is inapposite. Withdrawal of the rejection is not only warranted, it is also respectfully requested.

With the above remarks and amendments, it is believed that the claims, as they now stand, define patentable subject matter such that a passage of the instant invention to allowance is warranted. A Notice to that effect is earnestly solicited.

If any questions remain regarding the above matters, please contact Applicant's representative, Andrew D. Meikle, in the Washington metropolitan area at the phone number listed below.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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